

CLAIMS

1. A renewable energy flashlight comprising:

an elongated housing forming an opening at one end;

a barrel assembly located within the housing including:

a hollow elongated barrel disposed within the housing,

5 a wire coil wrapped around the barrel and disposed between the
barrel and the housing,

a charging magnet disposed within the barrel and sized to freely
oscillate within the barrel when the barrel is shaken,

10 two springs attached within the barrel and at either end of the
barrel to cause the magnet to recoil when the magnet
strikes the springs,

wherein the charging magnet oscillates within the barrel when
the barrel is shaken, whereby the charging magnet passes
back and forth through the wire coil and causes current to

15 flow within the coil; and

an electronics assembly located within the housing, said electronics
assembly including:

a capacitor for storing charge,

a rectifier connected to the capacitor;

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means for conducting current flowing in the wire coil to the

rectifier, whereby the rectifier rectifies the current, said

rectifier providing rectified current to the capacitor,

whereby the capacitor is charged,

a light emitting diode (LED) located near the housing opening, and

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switch means for selectively connecting the charged capacitor to

the LED, whereby the LED selectively lights up.

2. The flashlight of claim 1, further including an LED protecting diode connected between the LED and the capacitor, for protecting the LED from high voltage surges.

3. The flashlight of claim 2, further including a resistor and a capacitor protecting diode connected between the LED and the capacitor, for protecting the capacitor from sustained overvoltage conditions.

4. The flashlight of claim 3, wherein the LED protecting diode and the capacitor protecting diode are zener diodes.

5. The flashlight of claim 1, wherein the switch comprises a reed

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switch located within the housing, and a selectively movable switch magnet located external to the housing for activating the reed switch.

6. The flashlight of claim 1, wherein the charging magnet is a neodymium magnet.

7. The flashlight of claim 6, wherein the coil is formed of magnet wire.

8. The flashlight of claim 7, wherein the housing and the barrel are formed of plastic.

9. The flashlight of claim 8 wherein the springs are formed of stainless steel.

10. The flashlight of claim 1, further including a lens affixed within the housing opening adjacent to the LED, for collecting and projecting LED light into a nearly collimated beam.

11. The flashlight of claim 10, further including means for hermetically sealing the housing and the lens.

12. The flashlight of claim 11, wherein the housing and the lens form

a hermetically sealed compartment containing the electronics assembly and the barrel assembly, whereby the flashlight is explosion proof.

13. The flashlight of claim 10, wherein the lens is located less than its focal distance away from the LED, whereby the light from the LED forms a slightly expanding beam.

14. The flashlight of claim 10, further including an LED protecting diode connected across the LED, for protecting the LED from high voltage surges.

15. The flashlight of claim 14, further including a resistor and a capacitor protecting diode connected across the capacitor, for protecting the capacitor from sustained overvoltage conditions.

16. The flashlight of claim 15, wherein the LED protecting diode and the capacitor protecting diode are zener diodes.

17. The flashlight of claim 10, wherein the switch comprises a reed switch located within the housing, and a selectively movable switch magnet located external to the housing for activating the reed switch.

18. The flashlight of claim 10, wherein the charging magnet is a neodymium magnet.

19. The flashlight of claim 18, wherein the coil is formed of magnet wire.

20. The flashlight of claim 19, wherein the housing and the barrel are formed of plastic.

21. The flashlight of claim 20 wherein the springs are formed of stainless steel.